Amendments to the Claims

1 (Presently Amended) A combiner processor comprising:

a sliding correlator for correlating a serial stream of baseband symbols against a first codeword and forming a correlation peak output;

a training decision function coupled to said correlation peak output and generating a window output that is asserted at the start of an interval and unasserted at the end of said interval and also a training decision output;

a demultiplexer coupled to said correlation peak output and having a learn control input whereby when said demultiplexer learn control input is asserted:

said correlation peak output is coupled to a channel profile memory such that said correlation peak output is added to the contents of said channel profile memory when said training decision output is true and said correlation peak output is inverted and added to the contents of said channel profile memory when said training decision output is false;

and when said demultiplexer learn control input is not asserted:

said correlation peak output is multiplied with the complex conjugate of the contents of said channel profile

memory and coupled to an accumulator which adds said multiplier result ~~during~~ when ~~each~~ said window output is asserted and generates a decision output ~~at the end of each~~ when said window output is unasserted.

2 (Currently amended) The combiner processor of claim 1 wherein said first codeword is 11 bits.

3 (Currently amended) The combiner processor of claim 1 where said first codeword is a Barker codeword.

4 (Currently amended) The combiner processor of claim 1 wherein said first codeword is {+1,-1,+1,+1,-1,+1,+1,+1,-1,-1,-1}.

5 (Currently amended) The combiner processor of claim 1 wherein said first codeword is {-1,+1,-1,-1,+1,-1,-1,-1,+1,+1,+1}.

6 (Currently amended) The combiner processor of claim 1 wherein said serial stream of baseband symbols includes Barker codewords.

7 (Currently amended) The combiner processor of claim 1 wherein said serial stream of baseband symbols includes an in-phase component and a ~~is~~ quadrature component.

8 (Currently amended) The combiner processor of claim 7 wherein said serial stream of quadrature symbols includes an I channel and a Q channel.

11 ~~9~~ (Currently amended) The combiner processor of claim 1 wherein said training decision function window output ~~has~~ is asserted for a duration substantially equal to the duration of said codeword.

12 ~~10~~ (Currently amended) The combiner processor of claim 1 wherein said training decision function window output ~~includes~~ is asserted when pre-cursor symbols are arriving prior to the largest said correlation peak in said window output asserted duration.

13 ~~11~~ (Currently amended) The combiner processor of claim 1 wherein said training decision function window includes post-cursor symbols arriving after the largest said correlation peak in said window output asserted duration.

14 ~~12~~ (Currently amended) The combiner processor of claim 1 wherein said training decision output indicates which said codeword was received during said window output asserted duration.

15 ~~13~~ (Currently amended) The combiner processor of claim 1 wherein said demultiplexer learn input is asserted during a first interval.

16 ~~14~~ (Currently amended) The combiner processor of claim ~~13~~ 15 wherein said first interval occurs during the preamble of a received packet.

17 ~~15~~ (Currently amended) The combiner processor of claim ~~13~~ 15 wherein said first interval is greater than 10 said codeword symbols.

18 ~~16~~ (Currently amended) The combiner processor of claim 1 wherein said baseband symbols have an in-phase component and a quadrature component and said complex conjugate comprises negating the value of said quadrature component. ~~the Q channel.~~

19 ~~17~~ (Currently amended) The combiner processor of claim 1 wherein said channel profile memory is synchronized to said training decision function window output.

20 ~~18~~ (Currently amended) The combiner processor of claim 1 wherein said channel profile memory comprises a random access memory and a memory controller coupled to said random access memory.

21 ~~19~~ (Currently amended) The combiner processor of claim 1 wherein said correlation peak output has an in-phase component and a quadrature component, and said channel profile memory has associated in-phase storage and quadrature storage such that said correlation peak output in-phase component is added to said in-phase storage and said correlation peak output ~~adds~~ quadrature component is added in said quadrature storage ~~said~~ when said demultiplexer learn input is asserted.

22 ~~20~~ (Currently amended) The combiner processor of claim 1 wherein said channel profile memory is initialized when said demultiplexer learn control input is first asserted.

23 ~~21~~(Currently amended) The combiner processor of claim 1 wherein said channel profile memory has a number of locations equal to the number of samples in said codeword.

24 ~~22~~(Currently amended) The combiner processor of claim 1 wherein said accumulator includes a memory which is initialized at the start of each said window.

25 ~~23~~(Currently amended) The combiner processor of claim 1 wherein said accumulator includes a memory and an adder which adds the current said multiplier output to said memory contents.

26 ~~24~~(Currently amended) The combiner processor of claim 1 wherein said decision output compares said accumulated value against a threshold at the end of said window.

27 ~~25~~(Currently amended) The combiner processor of claim 26 ~~24~~ wherein said threshold is 0.

30 ~~26~~ (Currently amended) A combiner processor having two states:

a training state whereby a serial stream of baseband symbols is correlated against a first codeword, thereby producing a correlation peak output, said correlation peaks

examined by a training decision function to generate a window output indicating the extent of said symbol and a decision output which is either true or false, said correlation peaks added to a channel profile memory when said decision output is true and inverted and added to said channel profile memory when said decision output is false;

a decision state whereby said ~~serial stream of baseband symbols~~ correlation peak output is multiplied by the complex conjugate of the contents of said channel profile memory to produce a multiplier output;

an accumulator coupled to said multiplier output ~~whereby~~ wherein said ~~adder~~ accumulator is reset at the start of said window, accumulates the output of said multiplier during said window, and generates a binary output value at the end of said window.

31 ~~27~~(Currently amended) The combiner processor of claim 30 ~~26~~ wherein said first codeword is 11 bits.

32 ~~28~~(Currently amended) The combiner processor of claim 30 ~~26~~ wherein said first codeword is a Barker codeword.

33 ~~29~~(Currently amended) The combiner processor of claim 30 ~~26~~ wherein said first codeword is {+1,-1,+1,+1,-1,+1,+1,+1,-1,-1,-1}.

34 ~~30~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said first codeword is {-1,+1,-1,-1,+1,-1,-1,-1,+1,+1,+1}.

35 ~~31~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said serial stream of baseband symbols includes Barker codewords.

36 ~~32~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said serial stream of baseband symbols is two streams of symbols in quadrature phase.

37 ~~33~~ (Currently amended) The combiner processor of claim 36 ~~32~~ wherein said serial stream of quadrature phase symbols includes an I channel and a Q channel.

39 ~~34~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said training decision function window output has a duration equal to the duration of said codeword.

40 ~~35~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said training decision function window output

includes pre-cursor symbols arriving prior to the largest said correlation peak in said window.

41 ~~36~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said training window includes post-cursor symbols arriving after the largest said correlation peak in said window.

42 ~~37~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said training decision output indicates which said codeword was received during said window.

43 ~~38~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said training state occurs during a first interval.

44 ~~39~~ (Currently amended) The combiner processor of claim 43 ~~38~~ wherein said first interval occurs during the preamble of a received packet.

45 ~~40~~ (Currently amended) The combiner processor of claim 43 ~~38~~ wherein said first interval is greater than 10 said codeword symbols.

38 ~~41~~(Currently amended) The combiner processor of claim ~~26~~ 37 ~~33~~ wherein said complex conjugate comprises negating the value of ~~the~~said Q channel.

46
~~42~~(Currently amended) The combiner processor of claim ~~26~~ 30 wherein said channel profile memory is synchronized to said training decision function window output.

47
~~43~~(Currently amended) The combiner processor of claim ~~26~~ 30 wherein said channel profile memory comprises a random access memory and a memory controller coupled to said random access memory.

48
~~44~~(Currently amended) The combiner processor of claim ~~26~~ 30 wherein said channel profile memory adds quadrature said correlation peak output when said demultiplexer learn input is asserted.

49
~~45~~(Currently amended) The combiner processor of claim ~~26~~ 30 wherein said channel profile memory is initialized at the beginning of said training state.

50
~~46~~(Currently amended) The combiner processor of claim ~~26~~ 30 wherein said channel profile memory has a number of locations equal to the number of samples in said codeword.

51
~~47~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said accumulator includes a memory which is initialized at the start of each said window.

52
~~48~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said accumulator includes a memory and an adder which adds the current said multiplier output to said memory contents.

53
~~49~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said binary output compares said accumulated value against a threshold at the end of said window.

54
~~50~~ (Currently amended) The combiner processor of claim 53 ~~49~~ wherein said threshold is 0.

55
~~51~~ (Currently amended) The combiner processor of claim 30 ~~26~~ wherein said decision state occurs during a second interval.

57
~~52~~ (Currently amended) A process for generating a decision output from a serial stream of baseband symbols, said process comprising:

a first learning step comprising:

correlating said incoming serial stream with one or more codewords to generate a correlation output, examining ~~the~~ said correlation output to generate a training decision which is positive or negative, and also generating a window signal indicating the start and end of said incoming serial symbols, said incoming symbols added to the contents of a channel profile memory when said training decision is positive, and inverting said incoming symbols and adding to the contents of said channel profile memory when said training decision is negative;

a second decision step comprising:

multiplying said correlation peaks with the complex conjugate of said channel profile memory contents, thereby forming a multiplier output and accumulating said multiplier output during said window signal start time to said window signal end time to form a decision value, and comparing said decision value at the said window signal end time to form said decision output.

58 57
~~53~~ (Currently amended) The process of claim ~~52~~ wherein said first codeword is 11 bits.

59 57
~~54~~ (Currently amended) The process of claim ~~52~~ wherein said first codeword is a Barker codeword.

60 57
~~55~~ (Currently amended) The process of claim ~~52~~ wherein said first codeword is {+1,-1,+1,+1,-1,+1,+1,+1,-1,-1,-1}.

61 57
~~56~~ (Currently amended) The process of claim ~~52~~ wherein said first codeword is {-1,+1,-1,-1,+1,-1,-1,-1,+1,+1,+1}.

62 57
~~57~~ (Currently amended) The process of claim ~~52~~ wherein said serial stream of baseband symbols includes Barker codewords.

63 57
~~58~~ (Currently amended) The process of claim ~~52~~ wherein said serial stream of baseband symbols ~~is~~ has quadrature phase separation.

9 ~~59~~ (Currently amended) The combiner processor of claim 7 wherein said serial stream of quadrature phase symbols includes an I channel and a Q channel.

64 57
~~60~~ (Currently amended) The process of claim ~~52~~ wherein said window output has duration equal to the duration of said codeword.

65 57
~~61~~ (Currently amended) The process of claim ~~52~~ wherein said window output includes pre-cursor symbols arriving prior to the largest said correlation peak in said window.

66 57
~~62~~ (Currently amended) The process of claim ~~52~~ wherein said window includes post-cursor symbols arriving after the largest said correlation peak in said window.

67 57
~~63~~ (Currently amended) The process of claim ~~52~~ wherein said training decision output indicates which said codeword was received during said window.

68 57
~~64~~ (Currently amended) The process of claim ~~52~~ wherein said learning step precedes said decision step.

69 57
~~65~~ (Currently amended) The process of claim ~~52~~ wherein said learning step occurs during the preamble of a received packet.

70 57
~~66~~ (Currently amended) The process of claim ~~52~~ wherein said learning step uses more than 10 said codeword symbols.

combiner processor 9
~~67~~ (Currently amended) The ~~process~~ of claim ~~52~~ ~~59~~ wherein said complex conjugate comprises negating the value of ~~the~~ said Q channel.

71 57
~~68~~ (Currently amended) The process of claim ~~52~~ wherein said channel profile memory is synchronized to said window.

72 57
~~69~~ (Currently amended) The process of claim ~~52~~ wherein said channel profile memory comprises a random access memory and a memory controller coupled to said random access memory.

73 57
~~70~~ (Currently amended) The process of claim ~~52~~ wherein said correlation output has an in-phase component and a quadrature component, and said channel profile memory has in-phase storage and quadrature storage such that said correlation output in-phase component is added to said in-phase storage and said correlation output quadrature component is added to said quadrature storage ~~adds quadrature said correlation peak output~~ during said learning step.

74 57
~~71~~ (Currently amended) The process of claim ~~52~~ wherein said channel profile memory is initialized at the beginning of said learning step.

75 57
~~72~~ (Currently amended) The process of claim ~~52~~ wherein said channel profile memory has a number of locations equal to the number of samples in said codeword.

76 57
~~73~~ (Currently amended) The process of claim ~~52~~ wherein said accumulation includes a memory which is initialized at the start of each said window.

77 57
~~74~~ (Currently amended) The process of claim ~~52~~ wherein said accumulation includes a memory and an adder which adds the current said multiplier output to said memory contents.

78 57
~~75~~ (Currently amended) The process of claim ~~52~~ wherein said decision value compares said accumulated value against a threshold at the end of said window.

28
~~76~~ (Currently amended) The combiner processor of claim 26
~~24~~ wherein said threshold is 0.

80
~~77~~ (Currently amended) A combiner processor comprising:

a sliding correlator for correlating a serial stream of baseband symbols against a first codeword and forming a correlation peak output;

a training decision function coupled to said correlation peak output and generating a window output that is asserted during an interval, and unasserted at other times, the training decision function also generating ~~and~~ a training decision output;

said correlation peak output is coupled to a channel profile memory such that said correlation peak output is added to said channel profile memory when said training decision output is true and said correlation peak output is inverted and added to said channel profile memory when said training decision output is false; and

a decision control input whereby when said decision control input is asserted, said correlation peak output is multiplied with the complex conjugate of said channel profile memory and coupled to an accumulator which adds said multiplier result ~~during each~~ when said window output is asserted and generates a decision output ~~at the end of each~~ when said window output is unasserted.

81
~~78~~ (Currently amended) The combiner processor of claim 80
~~77~~ wherein said first codeword is 11 bits.

82
~~79~~ (Currently amended) The combiner processor of claim 80
~~77~~ wherein said first codeword is a Barker codeword.

83
~~80~~(Currently amended) The combiner processor of claim 80 ~~77~~ wherein said first codeword is {+1,-1,+1,+1,-1,+1,+1,+1,-1,-1,-1}.

84
~~81~~(Currently amended) The combiner processor of claim 80 ~~77~~ wherein said first codeword is {-1,+1,-1,-1,+1,-1,-1,-1,+1,+1,+1}.

85
~~82~~(Currently amended) The combiner processor of claim 80 ~~77~~ wherein said serial stream of baseband symbols includes Barker codewords.

86
~~83~~(Currently amended) The combiner processor of claim 80 ~~77~~ wherein said serial stream of baseband symbols is two streams of symbols in quadrature phase.

87
~~84~~(Currently amended) The combiner processor of claim ~~7~~ 80 ~~77~~ wherein said serial stream of quadrature symbols includes an I channel and a Q channel.

88
~~85~~(Currently amended) The combiner processor of claim 80 ~~77~~ wherein said training decision function window output has duration equal to the duration of said codeword.

90
~~86~~ (Currently amended) The combiner processor of claim 80
~~77~~ wherein said training decision function window output duration of assertion includes pre-cursor symbols ~~arriving~~ which arrive prior to the largest said correlation peak in said window output asserted duration.

91
~~87~~ (Currently amended) The combiner processor of claim 80
~~77~~ wherein said training decision function window output duration of assertion includes post-cursor symbols arriving after the largest said correlation peak in said window output asserted duration.

92
~~88~~ (Currently amended) The combiner processor of claim 80
~~77~~ wherein said training decision output indicates which said codeword was received during said window output asserted duration.

93
~~89~~ (Currently amended) The combiner processor of claim 80
~~77~~ wherein said decision input is not asserted during a first interval.

94
~~90~~ (Currently amended) The combiner processor of claim 93
~~89~~ wherein said first interval occurs during the preamble of a received packet.

95
~~91.~~ (Currently amended) The combiner processor of claim 93 ~~89~~ wherein said first interval is greater than 10 said codeword symbols.

88
~~92.~~ (Currently amended) The combiner processor of claim 87 ~~77 84~~ wherein said complex conjugate comprises negating the value of ~~the~~ said Q channel.

96
~~93.~~ (Currently amended) The combiner processor of claim 90 ~~77~~ wherein said channel profile memory is synchronized to said training decision function window output asserted duration.

97
~~94.~~ (Currently amended) The combiner processor of claim 90 ~~77~~ wherein said channel profile memory comprises a random access memory and a memory controller coupled to said random access memory.

98
~~95.~~ (Currently amended) The combiner processor of claim 80 ~~77~~ wherein said channel profile memory has an in-phase part and a quadrature part, and said combiner processor adds an in-phase component of said correlation peak output to said in-phase channel profile memory and also adds a quadrature phase component of said correlation peak output to said channel profile memory quadrature part~~at all times~~.

99
~~96~~ (Currently amended) The combiner processor of claim 80 ~~77~~ wherein said channel profile memory is initialized.

100
~~97~~ (Currently amended) The combiner processor of claim 80 ~~77~~ wherein said channel profile memory has a number of locations equal to the number of samples in said codeword.

101
~~98~~ (Currently amended) The combiner processor of claim 80 ~~77~~ wherein said accumulator includes a memory which is initialized at the start of each said window output assertion.

102
~~99~~ (Currently amended) The combiner processor of claim 80 ~~77~~ wherein said accumulator includes a memory and an adder which adds the current said multiplier output to said memory contents.

103
~~100~~ (Currently amended) The combiner processor of claim 80 ~~77~~ wherein said decision output compares said accumulated value against a threshold at the end of said window output assertion.

104
~~101~~ (Currently amended) The combiner processor of claim 103 ~~100~~ wherein said threshold is 0.

29
~~102~~(Currently amended) The combiner processor of claim 1 wherein said codewords are used for direct sequence spread spectrum communications.

56
~~103~~(Currently amended) The combiner processor of claim 26 wherein said codewords are used for direct sequence spread spectrum communications.

79 process
~~104~~(Currently amended) The ~~combiner processor~~ of claim 57 ~~52~~ wherein said codewords are used for direct sequence spread spectrum communications.

105(Currently amended) The combiner processor of claim 80 ~~77~~ wherein said codewords are used for direct sequence spread spectrum communications.